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- (54) Title of the invention: Community television  
receiving system
- (57) Abstract:

Purpose: To simply receive a TV broadcast such as a CS broadcast, BS broadcast, UHF broadcast and VHF broadcast and to attain excellent economy in the subject system.

Constitution: When a user selects a broadcast channel desired by a radio remote controller 21, a channel selection signal is sent. A headend converter 10 receives the channel selection signal and a channel selection circuit 12 selects a broadcast channel with a control signal from a channel control circuit 18. Then the selected broadcast signal is converted into a frequency of a dead channel at a frequency conversion circuit 13 to provide an output to a television receiver 4.

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### **[Claims]**

[Claim 1] In community television receiving system transmitting a branched broadcasting signal to a plurality of television receivers, including a radio type remote control unit which sends out a channel selection signal which shows a channel to tune in, a channel selection signal from a radio type remote control unit for changing by frequency conversion circuit and a broadcasting signal selected in a channel selection circuit and a channel selection circuit for choosing a channel of various broadcasts between the mentioned above antenna, and branching and a dispensing means into a signal of frequency of an unassigned channel, while sending out a control signal for tuning in according to a channel selection signal to the mentioned above channel selection circuit, community television receiving system adding a headend converter including a channel control circuit which sends out a control signal for changing into frequency of an unassigned channel to the mentioned above frequency conversion circuit, an antenna which receives various broadcasts of CS broadcasting, BS broadcasting, and the like, branching and a dispensing means which branches or distributes a signal received with the mentioned above antennas.

[Claim 2] The community television receiving system according to claim 1 characterized by inputting an output of this transmitter into the mentioned above headend converter, changing the mentioned above signal into a signal of frequency of an unassigned channel by a headend converter, and making it send out to a television receiver, a transmitter which changes video audio signals

other than a broadcasting signal into predetermined frequency, and sends them out is added.

[Claim 3] The community television receiving system according to claim 1 equipping a radio type remote control unit with a signal receiving part and an indicator, transmitting data of a channel assigned from a headend converter to a radio type remote control unit, and displaying the contents of the mentioned above data by an indicator of a radio type remote control unit.

### **[Detailed description of the invention]**

[0001] [Industrial application]

This invention relates to community television receiving system for a plurality of television receivers to receive TV broadcasts, such as CS broadcasting, BS broadcasting, UHF broadcast and VHF broadcasting.

[0002] [Description of the prior art]

The frequency of 12.5 GHz - 12.75 GHz which was assigned to CS broadcasting as for CS broadcasting normally, the local oscillation device which has the oscillating frequency of 11.2 GHz changes into the CS converter output frequency of 1300-1550 MHz assigned as a CS-IF frequency band, and is transmitted to each television receiver with a coaxial cable. A part of this frequency band has lapped with the frequency band of BS-IF signal. The frequency band of CS-IF signal of the satellite for CS broadcasting is lapped with a plurality of broadcast channels. For this reason, in the usual community television receiving system, when it was going to reproduce such TV broadcasts with a plurality of television receivers, as each broadcasting signal mixed

with the mixer was inseparable, it corresponded by community television receiving system as shown below.

[0003] In community television receiving system shown on drawing 6, reception of CS broadcasting and reception of BS broadcasting, UHF broadcast and VHF broadcasting are made into a separate system, and 2 CS broadcasting is further switched with the change device 5. That is, BS broadcasting, UHF broadcast, and VHF broadcasting mix respectively BS antenna A3, UHF antenna A4, and the broadcasting signal received by VHF antenna A5 with the mixer 1, and are sent to the television receiver 4 which contained the BS tuner by the coaxial cable 2 and the serial unit 3. CS broadcasting switches the broadcasting signal from CS antenna A1, A2 and 2 satellites received with the change device 5, and is sent to the television receiver 4 by the coaxial cable 2, the serial unit 3 and CS tuner 6.

[0004] In community television receiving system shown on drawing 7, 2 CS antennas A1, A2 and the broadcasting signal received are sent to the television receiver 4 by the coaxial cable 2, the serial unit 3, and CS tuner 6 of a separate system, the change device 5 for switching CS antenna A1, A2 is installed near each television receiver 4.

[0005] Community television receiving system shown on drawing 8 receives CS broadcasting, the channel array conversion device 7 is formed, the frequency of CS-IF signal of CS broadcasting is put in order and changed for every channel, after keeping the IF signal of CS broadcasting or CS broadcasting, and BS broadcasting from lapping, a signal is mixed with the mixer 8, and it is made to transmit with the one coaxial cable 2. The

branching filter 9 separates CS broadcasting and other broadcasts and a signal is inputted into each television receiver 4.

[0006] [Problems to be solved by the invention]

However, in community television receiving system shown on drawing 6, drawing 7, a plurality of coaxial cables 2 must be installed, a plurality of serial units 3 are also needed every television receiver 4, and it becomes of a high cost including a constructed part too. As the direction of community television receiving system of drawing 6 will be installed in the place where CS antenna A1 and the change device 5 for a change of A2 separated from the television receiver 4, it is not practical.

[0007] In community television receiving system shown on drawing 8, the channel array conversion device 7 turns into a large scale device, and for using in an ordinary home, economical efficiency is missing. In order to arrange all the channels, a large frequency band is needed, a signal transmission loss becomes large and a booster is needed.

[0008] In these community television receiving systems, when there were not a CS tuner and a BS tuner in each television receiver 4, there were problems that these broadcasts are not watched.

[0009] This invention is made in view of the mentioned above problems. There is the purpose in providing community television receiving system excellent in economical efficiency while being able to receive simply TV broadcasts, such as BS broadcasting, UHF broadcast and VHF broadcasting.

[0010] [Means for solving the problem]

In the invention according to claim 1, a community television receiving system branching broadcasting signal to a plurality of television receivers, including a radio type remote control unit which sends out a channel selection signal which shows a channel to tune in, a channel selection signal from a radio type remote control unit for changing by frequency conversion circuit and a broadcasting signal selected in a channel selection circuit and a channel selection circuit for choosing a channel of various broadcasts between the mentioned above antenna, and branching and a dispensing means into a signal of frequency of an unassigned channel, while sending out a control signal for tuning in according to a channel selection signal to the mentioned above channel selection circuit, community television receiving system adding a headend converter including a channel control circuit which sends out a control signal for changing into frequency of an unassigned channel to the mentioned above frequency conversion circuit, an antenna which receives various broadcasts of CS broadcasting, BS broadcasting, and the like, branching and a dispensing means which branches or distributes a signal received with the mentioned above antennas.

[0011] The invention according to claim 2 adds a transmitter which changes video audio signals other than a broadcasting signal into predetermined frequency, and sends them out in the invention according to claim 1, an output of this transmitter is inputted into the mentioned above headend converter, the mentioned above signal is changed into a signal of frequency of an unassigned

channel by a headend converter, and it is sent out to a television receiver.

[0012] The invention according to claim 3 equips a radio type remote control unit with a signal receiving part and an indicator in the invention according to claim 1, data of a channel assigned from a headend converter to a radio type remote control unit is transmitted, and the contents of the mentioned above data were displayed by an indicator of a radio type remote control unit.

[0013] [Function]

If it is in the community television receiving system of this invention, when the broadcast channel which a user wants to see is chosen with a radio type remote control unit, it is sent out by the channel selection signal and in a headend converter. A channel selection signal is received, and after changing into the frequency of an unassigned channel the broadcasting signal which tuned in and tuned in the broadcast channel with the control signal from a channel control circuit in the channel selection circuit in a frequency conversion circuit, it outputs to a television receiver.

[0014] After changing signals other than the broadcasting signal from VTR and the like into predetermined frequency, it is also possible to change into the signal of the frequency of an unassigned channel by a headend converter and to receive with a television receiver.

[0015] Also, it is possible to receive the information on the channel sent out from a headend converter in the signal receiving part which is included in the radio type remote control unit, and to display by an indicator.

[0016] [Example]

Next, one example of this invention is described based on a drawing.

[0017] Drawing 1 is an outline line-block diagram of the community television receiving system in which one example of this invention is shown, and drawing 2 is a block diagram showing the example of a headend converter.

[0018] A1z A2 are a CS antenna for CS broadcasting reception, A3 is BS antenna for BS broadcasting reception, A4 is a UHF antenna for UHF broadcast reception, and A5 is a VHF aerial for VHF broadcasting reception, 1 is a mixer that mixes UHF, VHF broadcast signals received by antennas A4, A5. 10 is a headend converter, with the channel selection signal from the mentioned below radio type remote control unit, tunes in the selected broadcasting signal and changes and outputs it to predetermined frequency. 3 is a serial unit that branches and sends the broadcasting signal outputted from the headend converter 10 to the television receiver 4.

[0019] 21 is a radio type remote control that transmits the channel selection signal which shows the broadcast channel which a user wants to see by operating a manual operation button and the like by radio.

[0020] 10 is a headend converter that includes the distribution circuit 11, the channel selection circuit 12, the frequency conversion circuit 13, the mixing circuit 14, the amplifying circuit 15, the antenna 16, the channel selection signal transmission and reception circuit 17, and the channel control circuit 18..



The IF signal of a broadcasting signal which is received with CS antenna A1, the IF signal of a broadcasting signal which received with CS antenna A2, the IF signal of a broadcasting signal which received by BS antenna A3 and UHF, VHF antenna A4, A5 and the signal with which each broadcasting signal received was mixed are inputted respectively to the headend converter 10, from the input terminal of IN1-IN4. The distribution circuit 11 is formed corresponding to each input terminals IN1-IN3, it distributes to the number of each channels to an IF signal. The channel selection circuit 12 tunes in the channel which was inputted from the input terminal of each IN1-IN3 and which should be chosen for every broadcasting signal with the control signal from the channel control circuit 18. It includes a filter corresponding to the number of broadcast channels. The frequency conversion circuit 13 is changed into the signal of the frequency of an unassigned channel with the control signal from the channel control circuit 18. That is, the signal of the channel tuned in the channel selection circuit 12 is changed into the frequency of the channel which is not used at the time. The mixing circuit 14 mixes each broadcasting signal by which frequency conversion was carried out in the frequency conversion circuit 12. The amplifying circuit 15 amplifies the signal mixed in the mixing circuit 14, and sends it out to the television receiver 4 from the output terminal OUT. The channel selection signal transmission and reception circuit 17 receives the channel selection signal sent out from the radio type remote control 21 by the antenna 16 or transmits channel information by the antenna 16.

While the channel control circuit 18 outputs the signal which shows the channel which should be tuned in to the channel selection circuit 12 with the channel selection signal outputted from the channel selection signal transmission and reception circuit 17 as a control signal, the information on an unassigned channel is always grasped and the control signal for transforming the broadcasting signal of the channel tuned in by the channel selection circuit 12 to the frequency of an unassigned channel is sent out to the frequency conversion circuit 13. [0021] Here, as channel frequency sent out from the headend converter 10, CS broadcasting will send out on either

- (1) frequency as it is,
- (2) frequency of the selected channels BS-IF, or it will lap with a CS-IF broadcast and will be sent out, frequency that is changed into another broadcast channel of CS-IF
- (3) the frequency changed into the unassigned channel of UHF, VHF broadcasting.

[0022] In addition, BS broadcasting will be sent out with either of

- (1) frequency as it is,
- (2) the frequency changed into the unassigned channel of UHF, VHF broadcasting.

[0023] The example shown by drawing 1 is an example in the case of changing CS broadcasting or BS broadcasting into the unassigned channel of UHF and VHF broadcasting, and transmitting it. In this case, the tuner for CS broadcasting or BS broadcasting is unnecessary.

[0024] Community television receiving system in the case of transmitting the broadcasting signal of CS broadcasting or a BS broadcasting channel with the frequency band of BS-IF or CS-IF signal is shown on drawing 3. That is, the branching filter 22 and CS tuner 6 are formed between the serial unit 3 and the television receiver 4, the broadcasting signal by which frequency conversion was carried out to the signal of the unassigned channel of BS-IF signal outputted from the headend converter 10 or CS-IF signal is separated spectrally into BS-IF signal and CS-IF signal with the branching filter 22, BS-IF signal is tuned in with the BS tuner built in the television receiver 4, and CS-IF signal can be tuned in by CS tuner 6, and can be reproduced with the television receiver 4.

[0025] Drawing 4 is a system in case of a plurality of television receivers receive the signal from VTR, a laser disc, and the like further in the mentioned above community television receiving system. The signal from VTR 24 is inputted into the HF band transmitter 23 connected to the serial unit 3, and it changes into the video signal and an audio signal of HF band channel frequency with the HF band transmitter 23, and sends out to the output terminal OUT of the headend converter 10. In the headend converter 10, as shown on drawing 5, in the circuit shown by drawing 2, the video signal of HF band channel frequency which added the separation circuits 19 and the frequency conversion circuit 20, and was inputted from the output terminal OUT, separating an audio signal from the output signal outputted by the separation circuits 19 from the amplifying circuit 15, and the video signal of the mentioned above HF band channel frequency, and an

audio signal with the control signal from the channel control circuit 18. After changing into the frequency of the unassigned channel of a UHF band and a VHF band, it sends out to the television receiver 4. Here, at this example, although the signal from VTR 24 was changed into the video signal and the audio signal of HF band channel frequency, with the HF band transmitter 23, it cannot be overemphasized that they may be of other frequency band.

[0026] Providing a signal receiving part (not represented) and the indicator 21a in the radio type remote control unit 21, and it is received at the radio type remote control unit 21 from the channel selection signal transmission and reception circuit 17 of the headend converter 10, if the data of the assigned frequency or the channel is transmitted by radio, it receives in a signal receiving part and the information is displayed by the mentioned above indicator 21a, the user of a radio type remote control unit can operate it, after getting to know the information on the channel assigned by the information on the channel displayed on the indicator 21a, and the like.

[0027] When channel information does not need to be transmitted from the headend converter 10 to the radio type remote control unit 21, the channel selection signal transmission and reception circuit 17 should have only a receiving function and a transmitting function becomes unnecessary.

[0028] [Effect of the invention]

As mentioned above, if the broadcast channel which a user wants to see, is chosen with a radio type remote control unit according to the community television receiving system of this invention, it is sent out by the channel selection signal and in a headend converter. Receiving a channel selection signal with the control signal from a channel control circuit as it was made to output to a television receiver after tuning in the broadcast channel in the channel selection circuit and changing the tuned-in broadcasting signal into the frequency of the unassigned channel in the frequency conversion circuit, while being able to receive simply TV broadcasts, such as CS broadcasting, BS broadcasting, UHF broadcast, and VHF broadcasting, community television receiving system excellent in economical efficiency is provided.

[0029] If it changes into the signal of the frequency of an unassigned channel by a headend converter and is made for a television receiver to receive after changing signals other than the broadcasting signal from VTR and the like into predetermined frequency, video signals and audio signals other than the broadcasting signal from VTR and the like are receivable too.

[0030] If the information on the channel sent out from a headend converter is received in the signal receiving part which is included in the radio type remote control unit and it is made to display by an indicator, the user of a radio type remote control unit can operate it, after getting to know the information on the assigned channel, and the like.

### **[Brief description of the drawings]**

[Drawing 1] is an outline line-block diagram showing one example of the community television receiving system of this invention.

[Drawing 2] is a block diagram showing one example of the headend converter according to the same as the above.

[Drawing 3] is an outline line-block diagram showing other examples of the community television receiving system of this invention.

[Drawing 4] is an outline line-block diagram showing the other examples of the community television receiving system of this invention.

[Drawing 5] is a block diagram showing one example of the headend converter according to the same as the above.

[Drawing 6] is an outline line-block diagram showing the conventional community television receiving system.

[Drawing 7] is an outline line-block diagram showing the conventional community television receiving system.

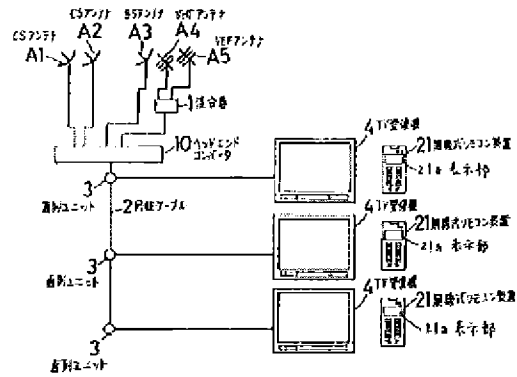
[Drawing 8] is an outline line-block diagram showing the conventional community television receiving system.

### **[Description of numerals]**

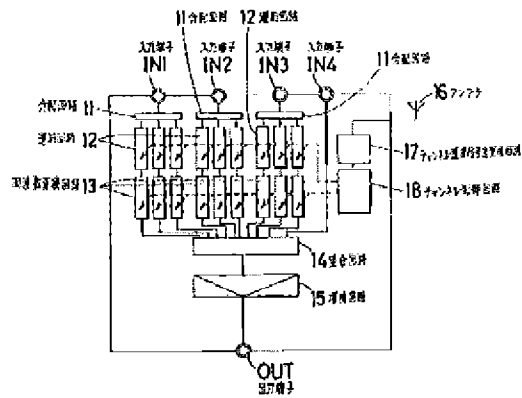
- 1 Mixer
- 2 Coaxial cable
- 3 Serial unit
- 4 Television receiver
- 5 Change device
- 6 CS tuner
- 7 Channel array conversion device
- 8 Mixer
- 9 Branching filter

10 Headend converter  
11 Distribution circuit  
12 Channel selection circuit  
13 Frequency conversion circuit  
14 Mixing circuit  
15 Amplifying circuit  
16 Antenna  
17 Channel selection signal transmission and reception circuit  
18 Channel control circuit  
19 Separation circuits  
20 Frequency conversion circuit  
21 Radio type remote control unit  
21a Indicator  
22 Branching filter  
23 HF band transmitter  
24 VTR  
A1 CS antenna  
A2 CS antenna  
A3 BS antenna  
A4 UHF antenna  
A5 VHF aerial  
IN1 Input terminal  
IN2 Input terminal  
IN3 Input terminal  
IN4 Input terminal  
OUT Output terminal

Drawing 1

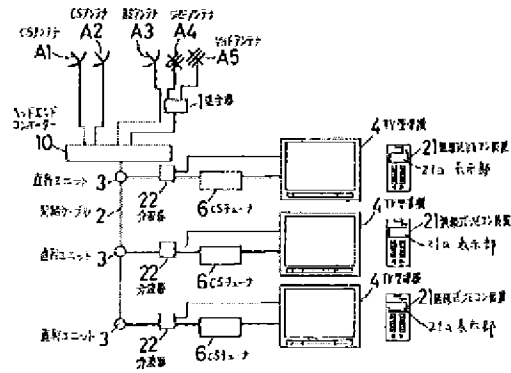


Drawing 2

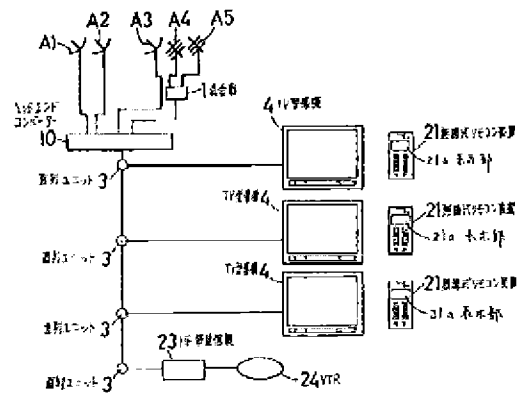




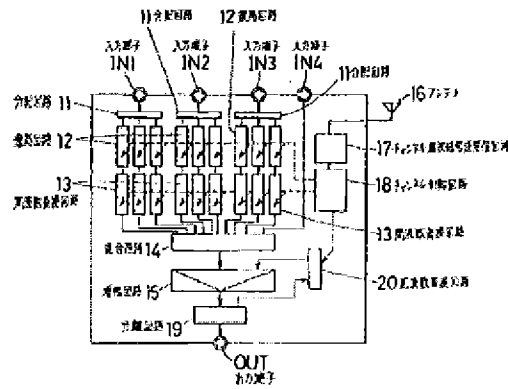
Drawing 3



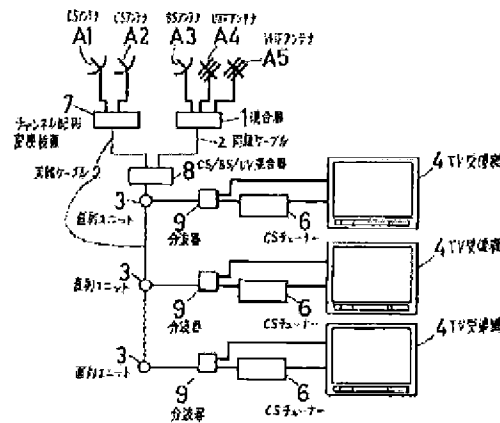
Drawing 4



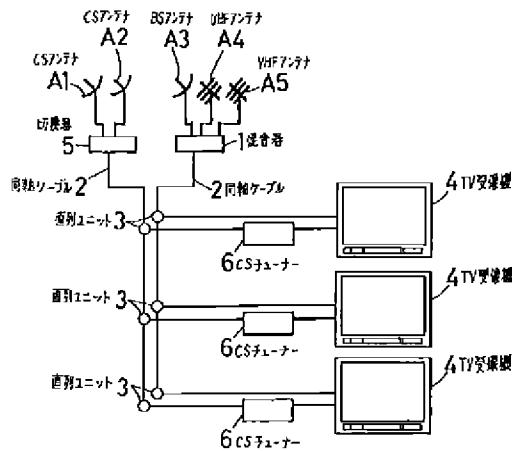
Drawing 5



Drawing 8



Drawing 6



Drawing 7

